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|  | December 1999 |

**Principles
for Effective Self‑Assessment
and Corrective Action Programs**



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| Introduction | This document provides principles for effective self-assessment and corrective action programs that promote improvement in performance. It builds upon and supports *Principles for Enhancing Professionalism of Nuclear Personnel* (March 1989). An industry task force developed these principles with assistance from the Institute of Nuclear Power Operations (INPO) and input from many U.S. nuclear utilities. A special committee of senior utility executives also provided valuable insight and perspective. Task force and committee members are acknowledged at the end of the document. In highly effective organizations, managers and workers seek continuous improvement by identifying and implementing opportunities for improvement. In these organizations, the need for improvement is driven from within rather than by external factors or influences.Self-assessment and corrective action programs are vehicles for identifying and implementing change. For this reason, they are important contributors to safe and reliable plant operation. Successful programs begin with a station culture that encourages self-critical, candid, and objective evaluation of performance against industry standards of excellence. Station management reinforces a questioning attitude within the workforce, promotes a safety-conscious work environment, and encourages the discovery and reporting of areas for improvement. Managers avoid a punitive approach to errors made in good faith or reacting defensively to suggestions for improvement. Working together, managers and employees are accountable for aggressively identifying problems, correcting performance shortfalls, and striving for continuous improvement in processes and activities.  |
| Background | The nuclear industry has made substantial progress in developing and implementing effective self-assessment and corrective action programs. In response to increasing industry interest in these areas, when INPO revised *Performance Objectives and Criteria for Operating Nuclear Electric Generating Stations* (INPO 97-002) in September 1997, a specific performance objective with supporting criteria for self-assessment and corrective action activities was included. *Principles for Effective Self-Assessment and Corrective Action Programs* provides information to help utilities meet the standards established by that performance objective and criteria. As such, this document is available to INPO member utilities and participants and INPO evaluation teams to help evaluate the effectiveness of activities in these areas.Although they are highly complementary and interrelated, the self-assessment and corrective action programs are discussed separately. Self‑assessment as used in this document broadly envelops those activities aimed at comparing existing performance to established standards to determine areas in need of improvement.[[1]](#footnote-1) Corrective action activities are those involved in problem identification, reporting, evaluation, correction, and trending.Self-assessment is the process of actively identifying opportunities for improvement or, in some cases, event precursors, to prevent significant performance shortfalls. Corrective action is more reactive, dealing with the appropriate resolution of known problems. Self-assessments are an important input to the corrective action program but are not the only source of input. External groups, such as INPO, raise issues that are often suitable for tracking under the corrective action program. The broad assessment of such inputs and what they mean from a station management perspective is, however, a self-assessment function.*Principles for Effective Self-Assessment and Corrective Action Programs* approaches the range of self-assessment options available from the perspective of the chief nuclear officer. Activities such as quality assurance or corporate oversight are included in this document’s scope, although some utilities consider these to be outside the realm of self-assessment because they are not conducted by the station organization. Only assessment sources that are outside the direct control of the utility—such as INPO evaluations or reviews and regulatory inspection activities—are excluded from the self-assessment definition. |
| Objective | Implementation of *Principles for Effective Self-Assessment* and *Corrective Action Programs* is intended to promote behaviors throughout an organization that support objective self-assessment and effective problem identification, evaluation, tracking, correction, and trending. The resultant self-assessment and corrective action activities will identify and resolve problems across a broad range of station endeavors. However, particular focus is needed on problems that detract from safe and reliable plant operation or that cause events. Identifying and correcting low-level issues in these areas can prevent more significant problems. |
|  | This document addresses basic principles rather than prescribing a specific program or implementing methods. Principles are printed in boldface type. Amplifying comments help clarify the intent of the principles and, in some cases, provide implementation options. As with INPO guideline documents and consistent with the INPO Institutional Plan, member utilities are expected to meet the intent of the principles but have latitude to develop specific implementation methods. |
| Essential Organizational Characteristics | Effective self-assessment and corrective action programs rely on certain organizational characteristics that provide support and enhance program effectiveness. These characteristics, common among highly effective organizations, are as follows:* A stationwide environment encourages employees (and contractors) to actively participate in the self-assessment and corrective action processes. Management fosters this environment by communicating the importance and interactive nature of these programs in improving station performance. Self-critical behaviors and an absence of defensiveness thrive in this environment.
* Management demonstrates ownership for the self-assessment and corrective action programs by directing, prioritizing, and sufficiently staffing program activities to ensure safe and reliable plant operation.
* Station employees recognize that minor problems are often precursors to more significant events, and they identify undesirable behaviors and deficient processes from these minor problems.
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| The Need for a Balanced Approach | Various self-assessment options are available. While the principles encourage strong station management self-assessment, they also recognize the value of independent oversight to help management identify opportunities for improvement. Additionally, many station management self-assessment options involve varying levels of effort and payoff. An effective self-assessment program integrates these options in a balanced way that provides senior utility and site managers an objective picture of current performance. In the corrective action program, a similar range of choices exists. Although all identified problems should be reported, management must define the tracking system(s) to be used and the reporting criteria for each, if different systems are used. Some stations use a single, formal corrective action program to track, screen, evaluate, trend, and resolve all issues. Others report and track very low-level (precursor) problems or behavioral issues using lower-tier tracking systems. These systems are typically managed at the departmental level and are separate from the formal corrective action program. Such tracking systems are periodically screened to preclude important problems that should be in the corrective action program from being reported instead to lower-tier tracking systems in which they may receive a lower level of analysis and corrective action. Ongoing checks help ensure these lower-tier systems are used as intended and do not compromise the corrective action program’s effectiveness. Addressing low-level issues through effective use of these lower-tier systems has increased ownership of issues at the department level and resulted in impressive improvement at some stations. Use of such lower-tier systems can also reduce the overall level of effort expended in resolving problems by enabling management to focus more intently on those problems reported to the formal corrective action program. The degree of evaluation that problems reported to the corrective action program receive can vary widely. Because of the time and effort involved in evaluation, station procedures must ensure that the most intensive evaluation is reserved for problems of highest significance.There is no single “best choice” solution to these various self-evaluation and corrective action decision options. Ultimately, the mix of station management self-assessment and independent oversight used must reflect an integrated and balanced approach. Management decisions regarding problem reporting systems, reporting criteria, and the extent of evaluation or investigation that problems receive must also strike a balance between evaluation thoroughness, corrective action timeliness, and resource allocation considerations. The most effective balance depends largely on how the self-assessment and corrective action programs fit into management’s continuous improvement strategy and the station’s level of performance. Management should periodically review this balance and adjust the programs as needed. |

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| Principles for Effective Self-Assessment Programs | The objective of a self-assessment program is to promote continuous improvement. Current performance is compared to management expectations, industry standards of excellence, and regulatory requirements to identify areas needing improvement. The self-assessment program strives to identify low-level precursor issues or trends for early resolution before more significant problems occur that can adversely affect plant safety, reliability, or regulatory performance. Self-assessments also identify strengths applicable to other station groups. The quality of self-assessment results directly affects a station’s ability to improve performance. Therefore, it is important that skilled, knowledgeable employees conduct self-assessments, using proven methods and the highest standards of performance as a guide. Each station must develop clear guidance for the overall program scope and management. The guidance must be used consistently and balance the use of the various self-assessment methods and resources. An effective self-assessment program embodies the following principles.1. **The self-assessment program is formally defined. It includes guidance for both ongoing and periodic focused self-assessments.**
	1. Ongoing self-assessments—Employees throughout the organization routinely conduct ongoing self-assessments to verify that standards of performance are being achieved.
		* Ongoing self-assessments generally need little advance planning or scheduling.
		* Managers periodically review the ongoing self-assessment activities to ensure critical performance areas are being addressed.
		* Examples of ongoing self-assessment techniques include the following:
* work space tours and routine worker interfaces, including informal interviews to determine if expectations are understood
* structured management/peer coaching or observation programs in which performance shortfalls are documented for further action (such as management observation of crew simulator performance and training activities)
* review and analysis of important operating parameters or other data or trend information
* management reviews of new corrective action program problem reports
* reviews of important process and employee performance data (such as backlogs and maintenance rework rate)
* event investigations and outage/maintenance activity critiques
* system or equipment walkdowns and reviews
* industrial safety inspections
* evaluation of industry operating experience
* benchmarking to identify opportunities for performance improvement
* periodic management reviews of performance, such as management review meetings

B. Focused self-assessments—An effective self-assessment program also uses periodic focused self-assessments to evaluate programs, processes, or performance areas against specific criteria. * + - Some periodic focused self-assessments are done on a recurring frequency.
		- Others are initiated in response to situations that warrant a closer review of performance. Focused self-assessment activities may be triggered by:
* trends in performance data, or problems tracked in the corrective action program
* plant events
* indications of process inefficiencies
* input from ongoing self-assessment activities or internal or external oversight groups
* benchmarking activities revealing potential performance issues that warrant a more focused review
* new regulatory requirements
* significant change initiatives for which an early progress check is needed
* new program implementation, or program or process revisions
* emergent industry issues
	+ - They are typically performed by teams, but occasionally may be performed by an individual.
		- Focused self-assessments are structured and comprehensive.
		- Focused self-assessments generally require planning, scheduling, and preparation.
* A long-range schedule integrates focused self-assessment activities to avoid overloading station departments.
* The schedule takes advantage of planned evolutions and activities, including other forms of evaluation.
* The schedule is flexible enough to accommodate emerging self-assessment needs.
* Focused self-assessment schedules are communicated to affected staff in time to allow sufficient planning.

2. **People with the necessary expertise conduct self-assessment activities.*** 1. Self-assessment assignments match skill requirements to an individual’s background and experience. Among the skills to be considered are:
		+ Technical expertise in the area being assessed
		+ Facility in interviewing, observing, and analyzing

B. Self-assessment assignments allow the opportunity for some on-the-job learning by less experienced staff to increase participation in the process and achieve better buy-in of the results.C. Self-assessment teams routinely include members from other departments (preferably from a “customer” functional area, as applicable), other stations, or external organizations. * + - External participation provides an outside perspective and objectivity.
		- Periodic use of team members from external organizations can also provide valuable input on ways to improve the entire self-assessment process.

D. Managers participate on some self-assessment teams to provide a broad management perspective.  |

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|  | 3. **The self-assessment process measures station performance against management expectations, high industry standards, operating experience, and regulatory requirements.*** 1. Industry standards are determined through activities or sources such as the following:
		+ Benchmarking and industry interactions
		+ Industry operating experience
		+ Industry documents such as INPO 97-002, *Performance Objectives and Criteria for Operating Nuclear Electric Generating Stations*, and ACAD 91-015, *Objectives and Criteria for Training in the Nuclear Power Industry*

B. Material used in preparing for and conducting self-assessments typically includes: * + - Historical information, such as corrective action program open and completed items, performance trends, lessons-learned critiques, station operating experience, and regulatory or other commitments
		- Current performance information, such as observation program results or plant performance parameters
		- Precursor information, such as data from cultural surveys or behavioral observation programs, if used
		- Reports from past audits, self-assessments or inspections
		- Feedback from external groups, such as INPO or regulatory agencies
1. **Each station organization routinely conducts its own self-assessments of programs, processes, and performance.**

Maintenance management, for example, schedules and manages the self-assessment activities within that group.5. **Independent oversight groups also periodically evaluate programs, processes, and performance.*** 1. These groups may include quality assurance, the independent safety engineering group, corporate staff members, and nuclear safety review boards (or equivalent, if used).

B. Independent self-assessments complement station management’s self-assessments and provide a valuable additional source of information. |
|  | 6. **Teams or individuals conducting self-assessments communicate closely with those being assessed to help ensure understanding of and ownership for the results.** Ongoing discussion of potential issues can help sharpen issue characterization and promote acceptance by those who must ultimately resolve the issues.7. **Station management verifies that the issues are promptly entered into the corrective action program or other tracking system for resolution.*** 1. Resolution of issues identified in self-assessments is timely, commensurate with their impact on safety and reliability.

B. When management determines that an issue identified by a self-assessment is not worthy of further action, this is documented and feedback is provided or made readily available to the identifier. This must be done with care and sensitivity so as not to discourage future problem identification.8. **Self-assessment results are communicated to affected groups and individuals.** * 1. Management periodically reviews the results of ongoing self-assessment activities with employees to improve performance. The following are some typical communication methods:
		+ group meeting discussions
		+ special flyers
		+ performance indicators posted in the workplace
		+ company intranet

B. Focused self-assessments results are reviewed by (or shared with):* + - the manager being assessed
		- the groups being evaluated
		- other groups consistent with station practice—For example, relevant strengths or areas for improvement may be shared with selected groups to improve performance.
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|  | 9. **Program effectiveness is periodically reviewed, using a combination of ongoing and periodic focused reviews, and is adjusted as necessary.*** 1. Ongoing indicators of the self-assessment program’s effectiveness include:
		+ recurring issues from previous self-assessments
		+ performance indicator results in areas where corrective actions have previously been implemented
		+ team member critiques of self-assessments
		+ comparison of focused self-assessment results against those of ongoing self-assessment activities (can check effectiveness of both)
		+ feedback from station managers whose areas were evaluated on the usefulness of the results
		+ comparison of self-assessment results with independent oversight group assessment results or external feedback, as available
		+ benchmarking of performance with other departments or external organizations
* to determine if self-assessment activities reflect best industry practices and standards
* to identify additional areas for improvement

B. Periodic focused reviews of the entire self-assessment program also assess the program’s effectiveness. * + - The station organization and/or independent oversight groups (including corporate groups) may conduct these reviews.
		- These reviews include follow-up on the results of previous reviews to determine if the intended corrective actions were implemented and effective.
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| Summary-Principles for Effective Self-Assessment Programs | 1. The self-assessment program is formally defined. It includes guidance for both ongoing and periodic focused self-assessments. 2. People with the necessary expertise conduct self-assessment activities.3. The self-assessment process measures station performance against management expectations, high industry standards, operating experience, and regulatory requirements.4. Each station organization routinely conducts its own self-assessments of programs, processes, and performance.  |
|  | 5. Independent oversight groups periodically evaluate programs, processes, and performance.6. Teams or individuals conducting self-assessments communicate closely with those being assessed to help ensure understanding of and ownership for the results. 7. Station management verifies that the issues are promptly entered into the corrective action program or other tracking system for resolution. 8. Self-assessment results are communicated to affected groups and individuals. 9. Program effectiveness is periodically reviewed, using a combination of ongoing and periodic focused reviews, and is adjusted as necessary. |

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| Principles for Effective Corrective Action Programs | The objective of a corrective action program is to identify, document, evaluate, and trend problems and to develop and implement appropriate actions to correct problems. The program is a vital tool for improving plant safety, reliability, and performance, as well as for helping prevent events.Management promotes the corrective action process, supporting and encouraging effective problem identification and correction. Self-assessments are a means of problem identification and are an important part of the corrective action program. Problems identified by other means are also entered into the program. The following principles are embodied in successful corrective action programs.1. **Management encourages employees at all levels in the organization to identify and report a broad range of problems.**A. Problems include issues requiring further evaluation and corrective action, as well as those easily corrected and documented for trending purposes only. B. Employees have a thorough understanding of the problem reporting process.C. Employees have easy access to problem reporting methods. D. An individual discovering a problem takes immediate actions to address it. These actions include: * + - reporting the problem to supervision and control room personnel as required
		- initiating or ensuring the initiation of a problem reporting document

E. If immediate actions are considered sufficient to resolve a problem, the problem reporting document is closed without further evaluation. * + - In this instance, the problem report remains in the corrective action database for trending purposes.
		- Minor and easy-to-correct problems may be precursors of more significant issues. Trending can provide an early indication of such issues.

2. **Management formally defines problem reporting criteria, the problem reporting system(s) to be used, the desired level(s) of problem evaluation, and the timeliness of corrective actions.** |

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|  | A. These management criteria balance evaluation thoroughness, corrective action timeliness, and resource allocation considerations.* + - The criteria ensure that the corrective action program is effectively integrated with management’s continuous improvement strategy.
		- Problems reported include nonconformances or departures from specified requirements or expectations, deviations, deficiencies, concerns, undesirable conditions, and near misses.
		- Non-consequential events or potential issues needing further investigation or analysis are also included.
		- Management trains the staff on the criteria to achieve understanding.

B. Some stations enter, track, and address low-level event precursors, behavioral issues, opportunities for improvement, or betterments in separate, lower-tier programs.* + - This may help management provide greater focus on the higher significance problems in the corrective action program.
		- If lower-tier systems are used, periodic checks are conducted to ensure that problems reported to the lower-tier system should not be reported instead to the formal corrective action program.

3. **New problems reported in the corrective action program are screened promptly for their effect on safety, reliability, operability, and reportability.** A. Management ensures that employees who screen problem reporting documents have the proper knowledge, technical expertise, and experience to perform this function.B. Management ensures that employees use a defined, consistent screening process.C. Management monitors the process to ensure consistent results. D. Management ensures that the generic problem implications are considered during problem screening, as appropriate.  |

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|  | 4. **Problems are evaluated, commensurate with their significance, to determine the cause(s).**A. The corrective action program formally defines the term “significant problem.” B. The program applies structured root cause evaluation techniques to important issues where recurrence is unacceptable.C. Individuals or teams with the appropriate knowledge and skills conduct problem analyses and corrective action determinations. 5. **Individuals or teams trained in root cause analysis techniques evaluate significant problems using a structured root cause methodology to identify root and contributing causes and corrective actions to prevent recurrence.[[2]](#footnote-2)2**A. The root cause evaluation includes an “extent-of-condition” determination to help ensure that corrective actions prevent recurrence where the problem occurred and in other places where it could occur. B. Contributing causes include leadership and organizational factors or behaviors, where applicable.6. **Evaluations of lower-significance problems focus on correcting the immediate (or apparent) cause and may not address the root cause.** A. For very simple problems, the cause may be obvious and does not need more rigorous analysis to determine corrective actions. B. For other lower-significance problems, corrective actions may correct the immediate situation but not prevent recurrence. If similar problems occur, trending can identify the commonalties and trend analysis can identify the root (or common) causes. |

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|  | 7. **Management ensures that corrective actions are approved, prioritized, and completed in a timely manner consistent with their significance.**  A. Managers ensure that problems are addressed in a timely manner.B. Managers are held accountable for meeting corrective action due dates.C. Extensions or exceptions are normally made only in response to emergent issues of higher priority.8. **Employees who identify problems receive prompt feedback about corrective actions.** A. Informing employees of corrective actions taken or planned helps motivate workers to continue using the corrective action process. B. Feedback may be direct or through easy access to an information management system.C. Feedback is particularly important if a submitted problem is determined to be invalid or not worthy of additional corrective action.9. **Problems and associated causes are trended to identify repeat occurrences, generic issues, and vulnerabilities at a low level before significant problems result.** A. Trending typically identifies problem categories (such as procedure problems or foreign material exclusion issues), responsible organizations, and specific activities or conditions. B. Trend coding is used to assist in this effort. * + - Trend codes are consistently applied.
		- The number of trend codes is limited.

C. Trend data is evaluated and summarized periodically, and station management reviews a report of the results.D. A problem report is prepared to document trends identified through analysis as needing additional evaluation and/or corrective action.  |
|  | 10. **Information in lower-tier performance observation or reporting programs is periodically assessed for trends needing additional evaluation or corrective action.** A. Such trends are reported as problems in the corrective action program. B. The site trending effort includes problems in these lower-tier programs. C. Consistently trending problems of a given type (such as procedure errors) across the entire site helps identify cross-functional weaknesses.11. **Corrective actions designed to prevent recurrence of significant problems are checked for effectiveness.** A. These checks help determine if corrective actions are effective in preventing recurrence. * + - Effectiveness checks are assigned and conducted at an appropriate interval after the corrective action is completed.
		- Completion of these checks is managed and monitored.

B. If the corrective action was not effective, the reason is determined and additional corrective action is taken.12. **The overall corrective action program is periodically monitored and assessed for effectiveness.** A. Performance indicators or other means of monitoring are used to identify areas for improvement. B. Monitoring activities determine ongoing process performance compared to management expectations. * + - They include a frequent review of open problems, problem evaluations, and corrective actions to ensure that priorities are appropriate and underlying issues with common causes are being addressed.
		- The causes of performance shortfalls are analyzed to determine needed corrective actions.
		- Trends indicating performance difficulties may indicate the need for focused self-assessment to determine underlying issues.
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|  | C. Senior site management frequently monitors corrective actions to ensure:* + - The age of outstanding corrective actions is reasonable.
		- Resources necessary to address open corrective actions are available.
		- Managers are held accountable for completing corrective actions.
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| Summary -Principles for Effective Corrective Action Programs | 1. Management encourages employees at all levels in the organization to identify and report a broad range of problems.2. Management formally defines problem reporting criteria, the problem reporting system(s) to be used, the desired level(s) of problem evaluation, and the timeliness of corrective actions.3. New problems reported in the corrective action program are screened promptly for their effect on safety, reliability, operability, and reportability. 4. Problems are evaluated, commensurate with their significance, to determine the cause(s).5. Individuals or teams trained in root cause analysis techniques evaluate significant problems using a structured root cause methodology to identify root and contributing causes and corrective actions to prevent recurrence.6. Evaluations of lower-significance problems focus on correcting the immediate (or apparent) cause and may not address the root cause. 7. Management ensures that corrective actions are approved, prioritized, and completed in a timely manner consistent with their significance. 8. Employees who identify problems receive prompt feedback about corrective actions.9. Problems and associated causes are trended to identify repeat occurrences, generic issues, and vulnerabilities at a low level before significant problems result.  |
|  | 10. Information in lower-tier performance observation or reporting programs is periodically assessed for trends needing additional evaluation or corrective action.11. Corrective actions designed to prevent recurrence of significant problems are checked for effectiveness. 12. The overall corrective action program is periodically monitored and assessed for effectiveness. |

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1. This usage is synonymous with the usage of the term self-evaluation in *Performance Objectives and Criteria for Operating Nuclear Electric Generating Stations* (INPO 97-002) and *Objectives and Criteria for Training in the Nuclear Power Industry* (ACAD 91-015*).* It envelops both self-assessment team activities and other activities such as benchmarking, event investigations, root-cause analyses, self- and peer-checking, and management monitoring. [↑](#footnote-ref-1)
2. 2 In some unusual cases (for example, steam generator tube degradation), management may elect not to take action to prevent recurrence but instead implement some alternative compensatory action that still ensures an acceptable degree of safety and reliability (such as a tube inspection and plugging program). In others, management may conclude, after investigation and better understanding of a problem’s impact on safety and reliability, not to invest in a final determination of root cause. Such decisions should be well documented. [↑](#footnote-ref-2)